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DATE: April 26, 2007

SUBJECT: Management Guidance for Salinity in Waste Discharge Requirements

SUMMARY
The Water Quality Control Plans (Basin Plans) adopted by the Regional Water Quality Control Board, Central Valley Region (Regional Board) set forth water quality objectives and implementation policies with respect to salinity. The Regional Board has stated in the Basin Plans its policy that control of salinity is a high priority. Salinity issues in waste discharge requirements (WDRs) and NPDES permits (Permits) should be treated consistently, that is similar situations should be addressed in a similar manner. WDRs and Permits need to clearly address salinity issues – a determination must be made on whether a salinity problem exists for the specific discharge, final and/or interim effluent limits generally imposed, and compliance time schedules prescribed. Salinity reduction from controllable factors should be sought as soon as possible, with efforts beginning immediately. It is recognized that some salinity problems may require many years to resolve. Salinity studies and control need not await rewriting of a WDR/Permit. Studies and action plans can be required under Section 13267 to begin salinity work and to have more complete information available when WDRs/Permits are prepared.

DISCUSSION
This Memorandum summarizes the the general approach to regulation of salinity in WDRs/Permits under the current policies, laws and regulations that govern the Regional Board. This is not a cookbook that is easily applied to every situation. The discharge circumstances and available data will vary with almost every discharge, so the specifics of each WDR/Permit will be somewhat different. This document provides guidance to staff for developing individual WDRs/Permits where salinity issues have not previously been addressed to be consistent with the Basin Plans and applicable laws and policies of the Regional Board. If permitting and/or enforcement action has been initiated for salinity issues at a specific

facility, that action and compliance time schedule should proceed. The final corrective action may be influenced by this guidance, but studies and corrective actions that have already been required of the Discharger should not be delayed because of this guidance.

When monitoring data suggests that salinity in a discharge could affect the quality of the waters of the state, WDRs and Permits must be consistent with the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), including the Basin Plan and, where applicable, the Clean Water Act. If the salt in the discharge could impact the beneficial uses of waters of the state, the WDRs must include effluent limits and/or receiving waters regulating the discharge of salts consistent with the Basin Plan and other applicable policies. If the salt concentration in the wastewater (TDS, electrical conductivity, or any anion/cation of the salt) has a reasonable potential to cause or contribute to exceedance of a water quality objective, an NPDES permit must include effluent limits as required by the Clean Water Act. Compliance with salinity effluent limits is not, however, always feasible, either being exceedingly expensive or technologically impossible. In other instances, compliance may be possible, but implementation may require many years, such as when community water supply improvement is required.

The Regional Board has established in the Basin Plans both numeric and narrative water quality objectives with respect to salinity and has established implementation policies for salinity, some that apply to specific locations and some that apply throughout the Basins. (Salinity receiving water objectives for specific water bodies are found in Table III-3 in the Sacramento-San Joaquin Rivers Basin Plan, and in Tables III-2 and III-3 in the Tulare Lake Basin Plan.) Both Basin Plans have adopted state drinking water standards, which include maximum contaminant levels (MCLs) for salt constituents. With respect to protection of drinking water, the MCLs include a range of concentrations with criteria for different circumstances. The Basin Plans set forth narrative objectives, including the chemical constituents objective that is applicable to salinity concerns. The Basin Plans includes several Implementation Policies that are relevant to salinity concerns. The “Policy for Application of Water Quality Objectives” sets forth the Regional Board’s adopted policy for applying numeric and narrative water quality objectives. It specifically sets forth a policy for establishing numeric limits to use in evaluating compliance with narrative objectives. The Regional Board is also required to implement State Water Board Resolution 68-16 (the anti-degradation policy), which prescribes conditions that must be met before water quality degradation can be allowed. To implement narrative objectives, the Basin Plan requires consideration, on a case-by-case basis, of relevant information to determine what numeric effluent or receiving water limit is most relevant and appropriate to protect the beneficial uses.

The detrimental impacts of salinity generally increase with increasing salinity concentrations.

- For drinking water supplies, taste, corrosion, and other non-health impacts occur over a wide range of concentrations of salt constituents. The Basin Plan has adopted state drinking water standards (MCLs) as water quality objectives for protection of the beneficial uses of municipal and domestic supply. Secondary drinking water standards (MCLs) for total dissolved solids or electrical conductivity have “recommended” (900 umhos/cm), “upper” (1600 umhos/cm), and “short-term” (2200 umhos/cm) numeric concentrations. The “recommended” concentration is intended to be protective of all drinking water uses. Drinking water containing salinity exceeding the highest, or “short-term” objectives is intended to be used when alternatives are not available. Which concentration is appropriate to be applied in a given WDR or Permit will depend on site-

specific information, including existing background conditions, short and long term beneficial uses of the water, and other factors.

- The Basin Plan contains a narrative chemical constituent objective, which is intended to protect all beneficial uses, and is the narrative objective most relevant to protection of agricultural irrigation uses. The Basin Plan's "Policy for Application of Water Quality Objectives" requires the consideration of relevant site-specific information and numerical criteria and guidelines developed by agencies and organizations. Several agencies and organizations have developed criteria and/or guidelines that are relevant and appropriate with respect to salinity. In general, water sources of 700 umhos/cm or less are considered to have no impact on any crop. As salinities increase above 700 umhos/cm the most salt sensitive crops become impacted, and additional crops are impacted as salinities increase. Some crops can tolerate salinities of thousands of umhos/cm. Increasing salinity into a range impacting a given crop will either result in reduction of production of the crop, or will require increased efforts by the farmer to counteract the effects of salinity. For instance, application of additional irrigation water to leach salts from the soil column can, in many instances, overcome the effects of increasing salinity in irrigation waters. There is, however, an economic and environmental cost to providing that extra irrigation water to offset the impacts of increased salinity. WDRs/Permits must reasonably protect the beneficial uses of the waters of the state.
- The Basin Plan contains numeric water quality objectives that are relevant to salinity and must be implemented in WDRs and Permits where applicable.

Salinity impacts are generally long-term impacts, the near-term seriousness of which may not seem to be appreciable. ANY SALINITY ABOVE BACKGROUND discharged to land or water increases the "inventory" of salt in the Region, that is, it increases the total salt contained in surface water, groundwater, and soil. As the salinity inventory increases, surface and ground water quality degrades, and soil salinity increases; crop productivity begins to decline. Crop productivity drops with increasing soil salinity until farming becomes infeasible. Brief periods of increased salinity do not usually kill plants or significantly reduce crop production, and any impacts can be reduced or eliminated by periods of lower salinity. Salinity concentrations in a continuous discharge are, therefore, of greater concern than the salinity of a short-term discharge such as a seasonal or interim discharge from a wastewater treatment plant or a de-watering discharge during a construction project. Any accumulation of salt in the soil, groundwater or surface water is also a concern.

Some types of salt can result in significant human health risks. For example, nitrates are a component of salt, and pose a significant human health risk. A primary (health-based) MCL of 10 mg/L of nitrate (as N) has been established by USEPA and the California Department of Health Services, and has been incorporated into the Basin Plans. Existing (although not cheap) treatment technologies can remove nitrates from wastewater. Any exceedance of nitrate receiving water objectives should be corrected as soon as possible, and health authorities should be consulted to deal with any human consumption of high-nitrate drinking water. If the discharge will cause the nitrate concentration in the receiving water to increase, in particular to increase above the MCL, effluent limitations and a compliance time schedule must be prescribed.

Other types of salts can have different impacts based on the nature of the salt. For example, TDS is comprised of both mineral dissolved solids (such as chloride and sodium) and organic

dissolved solids (such as sugars and organic acids). For Permits, it is not usually necessary to differentiate the two components of TDS because BOD effluent limits are normally prescribed that require treatment effectively removing most of the organic TDS. However, for land disposal where BOD limitations are not imposed (such as for food processing residuals spread on land), organic chemicals can comprise a substantial portion of the TDS. This organic TDS is a water quality concern, but the sources, treatment methods, and environmental impacts of organic TDS are very different from the sources, treatment methods, and environmental impacts of mineralized TDS. This guidance **DOES NOT APPLY** to organic TDS.

The Regional Board has embarked on a reevaluation of the Basin Plan salinity policy. How soon this process is completed, and what, if any, changes to the salinity policy and implementation plan will occur is unknown. Many years will be required to complete the Basin Planning process. In the meantime, current policies still exist, and failure to act now to minimize salinity impacts wherever reasonably feasible will only make corrective action in the future more difficult. Effluent limits, receiving water limits, compliance time schedules and other provision related to salinity should be included in WDRs/Permits being written now. The following is guidance for implementation of current Basin Plan and other policies relevant to salinity, with the short-term intent of minimizing salinity discharges and with the long-term intent to achieve appropriate salinity standards over time through implementation of control strategies that are consistent with the Basin Plan, reasonable, practicable, and do not impose upon dischargers an impossible regulatory requirement that is not technically feasible.

GUIDANCE

The following guidance is provided for implementing existing policy and regulation to increase consistency and reasonableness of WDRs and NPDES relative to salinity control:

1) The most stringent salinity limits may not be appropriate or necessary to protect the beneficial uses in all waterbodies,
2) Salinity limits should be based on applicable numeric water quality objectives and, where narrative objectives apply, based on relevant site-specific and other information to determine the most relevant and appropriate limits as set forth in the Policy for Application of Water Quality Objectives, and
3) Although reductions in wastewater salinity should be required as rapidly as is feasible, some solutions to salinity problems (such as replacement of a water supply) require many years or decades to implement, so longer compliance time schedules should be considered with appropriate interim limits and tasks to assure reasonable reductions.

The intent of this Guidance is to require identification of salt sources, development of salt control alternatives, and implementation of salinity control measures while any needed site-specific information is collected or developed to determine the appropriate effluent or receiving water limits. Salinity reductions should be accomplished as rapidly as feasible. Whether or not the discharger will ultimately be able to comply with final effluent and/or receiving water limitations when adopted will depend upon individual discharger circumstances. In some instances, water supply salinities may exceed desirable effluent and/or receiving water limitations, or a reasonable increment of salinization of the water supply will cause exceedance of the effluent and/or receiving water limitations. These dischargers will have to be dealt with by the Board on a case-by-case basis in the future, but reasonable measures to reduce effluent salinity should be undertaken as soon as possible. Application of treatment

technologies for salt removal from the wastewater treatment plant discharge (e.g., reverse osmosis or similar technologies) will not normally be required until all other options have been considered, although salt removal treatment should not be ruled out for saline non-municipal discharges or concentrated side streams.

The following should be considered when drafting each WDR/Permit:

- Numeric Effluent Limitations:
  - Water quality based effluent Limits: If the Basin Plans or Bay-Delta Plan prescribe numeric receiving water salinity standards, or if adequate studies have been completed to interpret a narrative Basin Plan salinity objective for the specific receiving water body, numeric effluent limitations can be calculated and prescribed.
  - Increment based effluent limits. The Tulare Lake Basin Plan limits the effluent salinity of municipal wastewater treatment plants to an increment of 500 umhos/cm over the weighted salinity of the municipal water supply. Although not required by the Sacramento-San Joaquin River Basin Plan, the 500 umhos/cm increment can be applied as BPTC.
  - Tulare Lake Basin Plan effluent limitations. The Tulare Lake Basin Plan contains a number of numeric effluent limitations applicable to specific discharge types in certain geographic areas. These limits include a maximum effluent salinity concentration for industrial discharges of 1000 umhos/cm. Although not required by the Sacramento-San Joaquin River Basin Plan, the 1000 umhos/cm industrial wastewater effluent limitation can be applied as BPTC.
  - Performance-based effluent limits. If sufficient information does not exist to prescribe any of the effluent limitations discussed above, or if the discharger cannot immediately comply with a prescribed effluent limit for EC and/or TDS, a interim effluent limits and a time schedule (as appropriate) can be prescribed. The purpose of the interim effluent limit is to prevent the effluent salinity from increasing above its current concentration. Normally these limits will be based on a long-term average, such as an annual average, unless there is significant seasonality to consider.
  - In general it is not necessary to prescribe limits for every salt constituent. If the discharger has a salinity problem, prescribing either TDS or EC limits, and possibly chlorides, is probably sufficient. NPDES Permits should limit the number of salinity-related effluent limits, and use indicators such as electrical conductivity or TDS as effluent limits. Note that where the Basin Plan contains numeric water quality objectives for salinity constituents, effluent limits may be required for these constituents, or at least should be considered.
- For all discharges, require that salinity in the wastewater be minimized to the extent feasible.
- For all dischargers that have an effluent salinity greater than the receiving water salinity, or where the mass or concentration of the salinity in the discharge increases, require an anti-degradation analysis consistent with Resolution 68-16 (if one has not already been done). Recognize that an increase in effluent flow will result in an increased mass discharge even if effluent concentrations are unchanged. The antidegradation analysis can be combined with the Salinity Source Reduction Report or Pollution Prevention Plan that deals with many similar issues. For discharges in the Tulare Lake Basin that are in compliance with the salinity effluent limits for constituents prescribed in the Tulare Lake

Basin Plan, the anti-degradation analysis was met by the adoption of the Basin Plan, so further anti-degradation studies may not needed, but staff should consult with the Office of Chief Counsel.

- For municipal dischargers of 1 mgd or larger (major municipal discharges within the NPDES Program) and non-municipal discharges[1] regardless of flow, require all the following:
    - A Salinity Source Reduction Report studying salt sources within a discharge and developing a program and compliance time schedule for minimizing salinity concentrations in the wastewater
        - The report will include salinity from the water supply, and alternatives for reducing salinity contributions from the water supply.

    - Implementation of the salinity reduction program.
        - For non-municipal salt sources to a municipal sewer system, the discharger should require equivalent salt reduction studies from the non-municipal sources and implementation of salt reduction measures by the industry. Non-municipal salt sources that cannot feasibly achieve further salinity reductions should NOT simply be prohibited from further discharge to the collection system. (If this doesn't just shut down the business, it would just transfer the salt discharge from the municipal sewer system to a separate NPDES or Non-15 Order.) Municipalities should work with non-municipal salt dischargers to seek reductions in discharges to the sanitary sewer. Treatment of the non-municipal waste streams or partial streams by reverse osmosis or similar technologies should be considered. Details on non-municipal salt sources should be included in the report to the Board.

    - Report to the Board on progress. A final report on salinity issues should be required within two years. This report should not just be a recitation of sampling and studies; it should demonstrate the positive steps that the discharger has made to reduce effluent salinity. Annual progress reports should be required, but it will normally take a number of years effort by the discharger to make significant progress on salinity control.

    - If the Board reviews the final report and determines that the Discharger has achieved satisfactory progress in actual reduction in salinity concentrations and adequate progress towards compliance with any interim or final effluent limits, the Board will consider granting additional time in compliance time schedules to allow the Discharger to continue progress towards compliance through source control. If the discharger fails to make reasonable progress in salinity control, the Board may reconsider the compliance time schedule and may require more immediate compliance.

[1] Analysis of a specific non-municipal discharge may indicate that salinity reduction efforts are not needed and additional studies and reports are unwarranted. For example, a once-through cooling water discharge where the source water and receiving water are the same water body, and no salinity is added to the cooling water stream, should require no salinity reduction efforts. This conclusion should be documented in the WDRs as a basis for not requiring salinity reduction work.

- If the effluent salinity may cause exceedance of Basin Plan numeric criteria or a water quality limit that implements a narrative objective:
    - For Non-15 WDRs, prescribe final effluent limits. Prescribe a compliance time schedule for compliance with final effluent limits. Absent discharge-specific information to establish a compliance time schedule, time frames will initially be in 15 – 20 year range. If the discharger fails to make reasonable progress in salinity control, the Board may reconsider the compliance time schedule and require more immediate compliance.
    - For NPDES Permits, state the final effluent limit in a Finding with an explanation that full implementation is not within the Permit term, and justification of the final effluent limits in the Information Sheet. Specify the length of time that discharger has to achieve compliance with salinity limits. Absent discharge-specific information to establish a compliance time schedule, time frames will initially be in 15 – 20 year range. If the discharger fails to make reasonable progress in salinity control, the Board may reconsider the compliance time schedule and require more immediate compliance. Final effluent limits and schedules cannot be placed in the enforceable part of the permit, as compliance time schedules cannot exceed 5 years without imposing MMPs. Include interim tasks to achieve compliance.

INTERIM EFFLUENT LIMITS

Performance-based Interim Effluent Limits

Prescribe an interim effluent limit that caps the current effluent salinity. This will prevent the effluent salinity from increasing while source identification and control studies are in progress. In general do not use statistical predictions of effluent quality to prescribe interim limits based on current effluent quality. Statistical projections from a limited number of data points can result in ludicrously high interim limits. It is better to not adopt a performance-based interim limit if limited data is available rather than adopt an extremely high limit that implies the Board is accepting of very high effluent salinities.

Increment-based Interim Effluent Limits/Goals

For municipal wastewater treatment plants, if the annual average effluent salinity exceeds 500 umhos/cm more than the annual weighted quality of the source water, consider prescribing an interim electrical conductivity effluent limitation equal to the weighted quality of the source water plus 500 umhos/cm as a screening value that the facility should achieve within a prescribed period of time. For Non 15 WDRs, the interim limit and compliance time schedule would be included in the enforceable part of the WDRs. For NPDES Permits, if the compliance time schedule is more than 5 years long, the interim limit and schedule would be included in a Finding that an interim effluent limitation for electrical conductivity umhos/cm will be included in the next NPDES Permit. [Note: For discharges within the Tulare Lake Basin, the 500 umhos/cm increment is a Basin Plan requirement, so would be an effluent limit, not an effluent goal. For discharges elsewhere in the Region, the 500 umhos/cm increment is guidance only; but does appear to be a determination by the Board of what constitutes “best practical treatment” under the Anti-Degradation Policy.]

Non-Municipal Interim Effluent Limits

For non-municipal discharges, if the annual average effluent salinity exceeds 1000 umhos/cm (note: this is not an incremental value), consider prescribing an interim electrical conductivity effluent limitation of 1000 umhos/cm. For Non 15 WDRs, the interim limit and compliance time

schedule would be included in the enforceable part of the WDRs. For NPDES Permits, if the compliance time schedule is more than 5 years long, the interim limit and schedule would be included in a Finding that an interim effluent limitation for electrical conductivity umhos/cm will be included in the next NPDES Permit. [Note: For discharges within the Tulare Lake Basin, the 1000 umhos/cm limit is a Basin Plan requirement. For discharges elsewhere in the Region, the 1000 umhos/cm limit is guidance only; but does appear to be a determination by the Board of what constitutes "best practical treatment" under the Anti-Degradation Policy.]

Establish Objectives for values to implement narrative objective in Permit/WDRs. See flowchart.

Agricultural Irrigation Beneficial Use of Receiving Water

- If effluent salinity <= 700 umhos/cm (<= 450 mg/L TDS), require salinity minimization, with a report on efforts due in two years.
- If effluent salinity > 700 umhos/cm (> 450 mg/L TDS), determine whether or not sufficient information exists to implement the narrative objective to establish a receiving water salinity limit for local site conditions (crop patterns, soils, rainfall, etc.). If sufficient information exists, establish final effluent limits in the WDRs/Permit to fully protect the receiving water and include interim limits and compliance time schedules as needed. If sufficient information is not available to determine an appropriate numeric limit to implement a narrative objective, require the discharger to conduct a study of local irrigation practices and propose a salinity objective for future consideration. Require a comprehensive report due on salinity control studies and efforts within two years, and require implementation of salinity control measures.

Municipal Beneficial Use (equivalent guidance for TDS, chloride and sulfate)
[note: may need to consider both AG and MUN uses in the event that ag use salt concentration is ultimately increased above MUN levels]

- If effluent <= 900 umhos/cm (<= 500 mg/L TDS), require salinity minimization. A comprehensive report on efforts would be required within two years. An antidegradation analysis would be needed if the effluent salinity is greater than receiving water salinity, or if an increase in the mass discharge of salinity is being allowed.
- If effluent > 900 umhos/cm (>500 mg/L TDS), determine whether or not sufficient information exits to determine which of the three secondary salinity MCLs should be applied to the receiving water. If sufficient information exists, set final effluent limits in the permit/WDRs to fully protect the receiving water salinity for Municipal Use. The effluent limit will be implemented as soon as possible, dependent upon case-specific circumstances. Require discharger to conduct study of local drinking water intakes and give option to propose alternative use of upper or short-term MCLs as final effluent limits for future consideration, with a comprehensive report due on salinity control studies and efforts within two years.. An antidegradation analysis would be needed if the effluent salinity is greater than receiving water salinity, or if an increase in the mass discharge of salinity is being allowed.

Numeric Receiving Water Objectives

Numeric salinity objectives are prescribed in the Basin Plans for selected water bodies. If there is an adopted numeric salinity standard for a specific use, that standard must be implemented, if needed, with final effluent limits and compliance time schedules. If the

numeric salinity objectives in the Basin Plans are not applicable (for example, the receiving water is not designated MUN so the MCLs do not apply), the Basin Plan narrative chemical constituent objective is relevant to determination of limits for salinity. .

New Dischargers

The above discussion applies primarily to existing dischargers. Generally new dischargers should be in compliance when they start discharging. ["New" in this context refers to a source of wastewater that did not previously exist, such as a newly constructed residential area or a new industry. An existing discharge that changes location or switches from land to surface water disposal, or most any other circumstance where the waste stream already exists, would not be "new" for this purpose.]

New dischargers should plan in advance to minimize and control salt discharges within their systems. There will be circumstances under which a "new" discharge will not be able to meet desired salt limitations, and should be placed on compliance time schedules similar to an existing discharge. The most obvious case is when the only reasonable water supply for the discharger is already sufficiently saline that compliance with final effluent limits is not possible without reverse osmosis or similar treatment. If the new discharge threatens a significant water quality problem, particularly a water quality degradation that will impact other water users, then protective effluent limits should be effective immediately.

Groundwater Cleanups

Groundwater cleanups often involve the discharge of treated groundwater to a surface water or back to the groundwater by injection or infiltration. If the salinity of the groundwater being treated exceeds the salinity of the receiving water (ground or surface water), there will be anti-degradation and possible pollution issues to be dealt with regarding the salinity impacts on the receiving water. If the purpose of the cleanup is to remove constituents other than salt, there may be an overall benefit to the people of the State to allowing or expediting the cleanup that will be a factor in conducting the anti-degradation analysis for the discharge of treated groundwater. For instance, a PCE cleanup to protect municipal water supply wells is certainly to the benefit to the people of the State. If the only reasonable means of conducting the clean will require discharge of treated groundwater to lower salinity receiving water, the benefit of protecting the municipal water supply should be part of the anti-degradation analysis. The discharge should not cause loss of beneficial use in the receiving water.

ATTACHMENT A

GENERAL APPROACH TO WRITING THE WDRS

The following text and attached flow chart outline the steps to evaluating salinity issues and decisions that must be made to decide on how salinity should be addressed in an individual WDR/Permit under current Policy and law.

Evaluate effluent and receiving water (surface or ground water), salinity data. If there is not enough data to properly characterize the effluent and receiving water, do not set final effluent limits, require monitoring for future use, and consider implementing source identification and reduction efforts for salinity.

Based on the effluent, receiving water, and water supply data that is available, does it look like there is a possible water quality problem? If there may be a water quality problem, continue to evaluate. If available data indicates there is unlikely to be a water quality problem, document that conclusion, and don't make the discharger do a lot more.

If it looks like there may be a water quality problem, and there is not enough data to do a complete evaluation, start the discharger working on receiving water and water supply characterizations, and anti-degradation and salinity reduction analyses, as needed. Prescribe time schedules to get all this information together in two years or less so that a comprehensive review of salinity can be conducted and appropriate effluent limitations and compliance time schedules can be prescribed in a renewed/updated Permit/WDRs. We do not need to spend years fully characterizing effluent and receiving water before we start a discharger addressing salt. Unless there clearly is not a problem, salt source identification and reduction activities should begin immediately, even if full compliance with fully protective effluent limits is years off.

Is the effluent salinity greater than the receiving water salinity? If so, an anti-degradation analysis is needed. If the discharge conditions allowed by the new permit/WDR, the anti-degradation analysis may have already been done for an older permit/WDR. In the Tulare Lake Basin, if implementing the Tulare Lake Basin Plan effluent limits, no further anti-degradation may be needed for constituents addressed in the Tulare Lake Basin Plan.

If the discharge salinity is above the thresholds of(water supply + 500 umhos/cm for municipal wastewater, or 1000 umhos/cm for non-municipal wastewater [except in the Tulare Lake basin where the most stringent of these two standards apply to ALL discharges], the discharge likely contains controllable salt sources, so a salt reduction study would be required. These standards can be applied as either final effluent limits if the limits are protective of the receiving water, or as interim effluent limits if the standards are not or may not be protective of the receiving water.

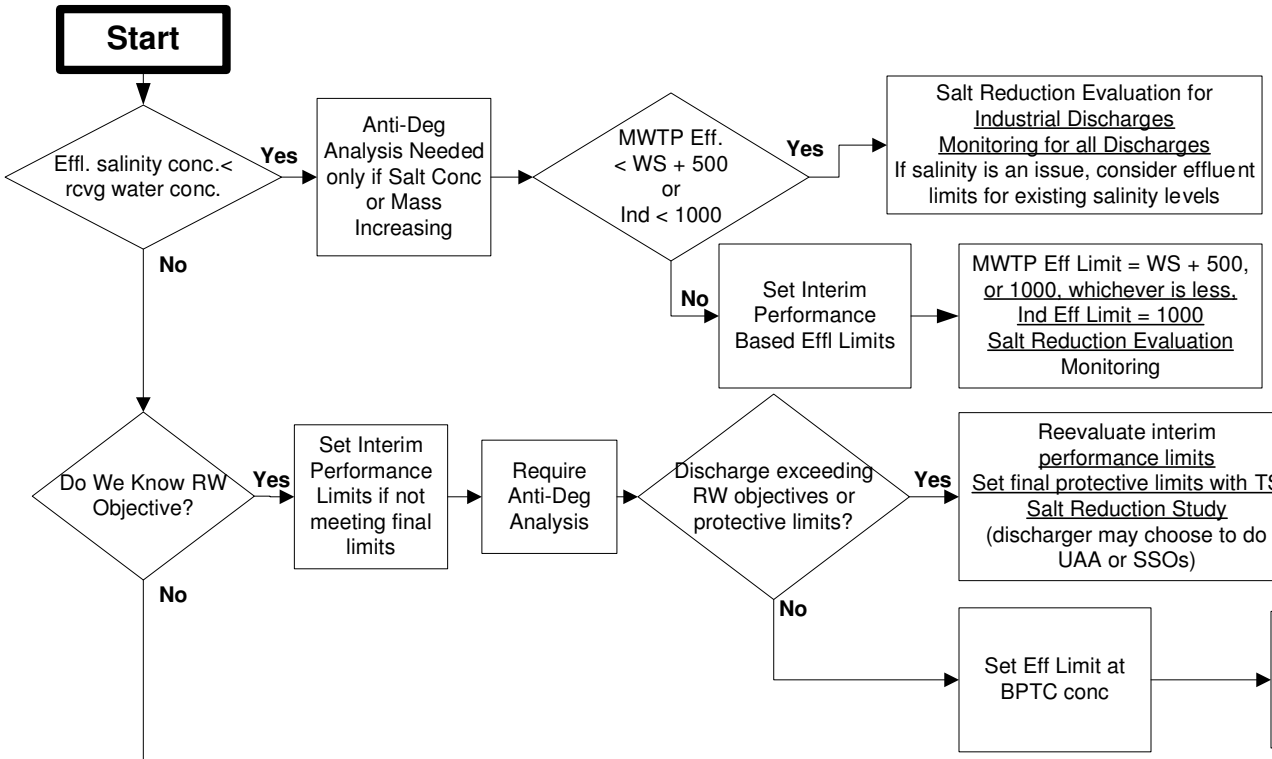
Do we know what the salinity standards are for the surface or groundwater? If not, site-specific studies may be needed to determine appropriate salinity concentrations to implement the narrative Basin Plan objectives. Prescribe time schedules for such studies, if needed. Final effluent limitations should not be prescribed until the beneficial uses and associated water quality objectives are determined. If sufficient data and evaluations are available, determine protective effluent limits.

If the discharger cannot comply with the protective effluent limits, prescribe compliance time schedules. These schedules may be decades long if ultimately water supply improvements are needed. Prescribe performance-based effluent limits based on current effluent quality so that the discharger cannot increase the existing salinity concentrations in the effluent.

If the compliance time schedule is lengthy, consider adoption of intermediate interim effluent limits (enforceable numbers) or effluent goals (non-enforceable numbers) to require or encourage the discharger to begin making progress in salinity reduction in the near term, rather than waiting to the end of the entire compliance time schedule. Again, progress toward salinity reduction should begin immediately.

General Guidance to Establish Salinity Limitations in Waste Discharge Requirements and NPDES Permits under Existing Salinity Policies

This chart shows a general approach to conducting studies and developing salinity-related limitations. Each case is unique. WDR/Permit conditions must be developed on a case-by-case basis in consideration of discharge, receiving water, and other available information.



Note: All salinity concentrations on this flowchart are in umhos/cm. Equivalent concentrations of TDS may be used unless there are significant concentrations of volatile dissolved solids in the wastewater.

Screening Values

Water quality limits used as fully-protective objectives when site-specific objectives have not been developed

Agricultural Use - 700 umhos/cm, or 450 mg/l TDS, and 106 mg/L chloride

Municipal/Domestic Use - 900 umhos/cm, or 500 mg/l TDS, and 250 mg/L chloride

Abbreviations

BU - Beneficial Use
Eff - Effluent
Ind - Industrial Waste - wastes which are predominantly NOT domestic sewage
MWTP - Municipal Wastewater Treatment Plant - plant treating predominantly domestic wastewater
RW - Receiving Water (surface or ground water)
SSO - Site Specific Objectives - site-specific standards to protect beneficial uses
TS - Time Schedule adopted in WDR, Permit, CDO or TSO
UAA - Use Attainability Analysis - site-specific evaluation of beneficial uses
WS - Water Supply

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Attachment B - Salinity Water Quality Objectives

Salinity water quality objectives are found as numeric or narrative objectives in the Water Quality Control Plans.

Chemical Constituents Objective

Secondary Drinking Water Maximum Contaminant Levels (MCLs) are incorporated by reference from the California Code of Regulations into the Basin Plan as numeric objectives.

Secondary MCLs:

	Maximum Contaminant Level Ranges		
Constituents	***Recommended***	***Upper***	***Short Term***
TDS, mg/L	500	1000	1500
EC, umhos/cm	900	1600	2200
Chloride, mg/L	250	500	600
Sulfate, mg/L	250	500	600

Narrative Objective: "Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."

Salinity Objectives

The Tulare Lake Basin Plan contains the following narrative: "Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources."

Tables in Chapter III of both Basin Plans prescribe site-specific TDS and electrical conductivity objectives for a number of water bodies.

Basin Plan Numeric Salinity Effluent Limitations

Chapter IV of the Tulare Lake Basin Plan (Page IV-9) prescribes minimum effluent limits for Discharges to Navigable Waters. These include:

- The maximum EC of a discharge shall not exceed the weighted quality of the source water plus 500 umhos/cm or 1,000 umhos/cm, whichever is more stringent.
- Discharges shall not exceed an EC or 1,000 umhos/cm, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L
- In addition to the above, discharges to waters having an EC or water quality objective of less than 150 umhos/cm shall provide removal of dissolved solids to levels consistent with those of the receiving water.

Chapter IV of the Tulare Lake Basin Plan (Page IV-10) also prescribes minimum effluent limits for Discharges to Land

- The maximum EC of a discharge shall not exceed the weighted quality of the source water plus 500 umhos/cm
- Discharges to areas that may recharge to good quality ground waters shall not exceed and EC of 1,000 umhos/cm, a chloride content of 175 mg/l, or a boron content of 1.0 mg/l.

- Additional numeric limits are prescribed for discharges in the Poso Creek and White Wolf Subareas, and for oil field sumps.

Chapter IV of the Tulare Lake Basin Plan (page IV-13) also limits the increase in EC of a point source discharge to surface water or land to a maximum of 500 umhos/cm. A lower limit may be required to assure compliance with water quality objectives. A number of exceptions to this numeric increment are provided for specific types of discharges.

State Water Board Water Rights Decision 1641 implementing the Bay Delta Plan prescribes salinity objectives that must be met at specific locations throughout the Bay Delta System. Although these objectives are not applicable throughout the entire water, they do prescribe compliance points that must be considered for all upstream discharges.

State Water Board Order 68-16 Anti-Degradation Policy allows degradation only under specified conditions. If a discharge contains concentrations of salinity exceeding the receiving water salinity concentrations or would increase the mass of the waste constituent, then an anti-degradation analysis must be completed for salinity.

Attachment C – Example WDR Language

THIS LANGUAGE IS A SIMPLE REQUEST FOR PREPARATION AND IMPLEENTATION OF A SALINITY MINIMIZATION PLAN. MORE DETAILED REQUIREMENTS MAY BE PRESCRIBED FOR THE PLAN AS DETAILED IN THE SECOND EXAMPLE. SELECTION OF THE DETAIL NEEDED IN THE PLAN AND THE LENGTH OF TIME FOR PLAN DEVELOPMENT WILL DEPEND ON THE CURRENT UNDERSTANDING OF SALINITY IN THE SYSTEM (PERHAPS NO ADDITIONAL STUDIES ARE NEEDED), HOW COMPLEX THE SITUATION APPEARS TO BE, AND HOW SERIOUS THE SALINITY PROBLEM IS.

Salinity Evaluation and Minimization Plan

The Discharger shall prepare and implement a salinity evaluation and minimization plan to address sources of salinity to the wastewater treatment system. The Plan shall be completed and submitted to the Regional Board by _____.

THIS LANGUAGE IS PATTERNED AFTER CWC SECTION 13263(d)3 POLLUTION PREVENTION PLANS WHICH ARE SPECIFIC TO NPDES. HOWEVER THE CONCEPTS AND VIRTUALLY ALL THE LANGUAGE IS EQUALLY APPLICABLE TO A NON-15 SALINITY REDUCTION PLAN. POLLUTION PREVENTION PLANS SHOULD BE USED ONLY IN NPDES PERMITS WHERE FINAL EFFLUENT LIMITS ARE PRESCRIBED AND THE DISCHARGER CANNOT COMPLY WITH THOSE EFFLUENT LIMITS. SIMILAR REQUIREMENTS CAN BE WRITTEN INTO A PROVISION NOT REFERENCING SECTION 13262.

a) **CWC section 13263.3(d)(3) Pollution Prevention Plans.** The pollution prevention plans required for salinity shall, at minimum, meet the requirements outlined in CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plans included the following:

   i) An estimate of all of the sources of a pollutant contributing, or potentially contributing, to the loadings of a pollutant in the treatment plant influent including water supply, water softeners, and other residential, commercial and industrial salinity sources.

   ii) An analysis of the methods that could be used to prevent the discharge of the pollutants into the Facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the Facility. The analysis also shall identify sources, or potential sources, not within the ability or authority of the Discharger to control, such as pollutants in the potable water supply, airborne pollutants, pharmaceuticals, or pesticides, and estimate the magnitude of those sources, to the extent feasible.

   iii) An estimate of load reductions that may be attained through the methods identified in subparagraph ii.

   iv) A plan for monitoring the results of the pollution prevention program.

v) A description of the tasks, cost, and time required to investigate and implement various elements in the pollution prevention plan.

vi) A statement of the Discharger's pollution prevention goals and strategies, including priorities for short-term and long-term action, and a description of the Discharger's intended pollution prevention activities for the immediate future.

vii) A description of the Discharger's existing pollution prevention programs.

viii) An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.

ix) An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.

x) Progress to date in reducing the concentration and/or mass of salinity in the discharge.